

**ABSTRACT**

**[0044]** A number of materials with the composition  $\text{Li}_{1+x}\text{Ni}_\alpha\text{Mn}_\beta\text{Co}_\gamma\text{M}'_\delta\text{O}_{2-z}\text{F}_z$  ( $\text{M}' = \text{Mg}, \text{Zn}, \text{Al}, \text{Ga}, \text{B}, \text{Zr}, \text{Ti}$ ) for use with rechargeable batteries, wherein  $x$  is between about 0 and 0.3,  $\alpha$  is between about 0.2 and 0.6,  $\beta$  is between about 0.2 and 0.6,  $\gamma$  is between about 0 and 0.3,  $\delta$  is between about 0 and 0.15, and  $z$  is between about 0 and 0.2. Adding the above metal and fluorine dopants affects capacity, impedance, and stability of the layered oxide structure during electrochemical cycling.